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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* SAAD SIROHEY, TOAN THANH LE,  
TINSU PAN, SHIYING HU, and LITAO YAN

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Appeal 2009-003226  
Application 10/711,189  
Technology Center 2600

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Decided: June 14, 2010

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Before KENNETH W. HAIRSTON, THOMAS S. HAHN,  
and BRADLEY W. BAUMEISTER *Administrative Patent Judges*.

HAHN, Administrative Patent Judge.

**DECISION ON APPEAL**

Appellants invoke our review under 35 U.S.C. § 134 from the final rejection of claims 1, 6, 17-26, 31, and 42-50.<sup>1</sup> We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

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<sup>1</sup> The Examiner substantively withdrew the final rejection under § 103(a) for pending claims 2-5, 7-15, 27-30, and 32-41 by reporting these claims objected to and that they would be allowable if rewritten in independent form to include all base and intervening claim limitations (Ans. 16).

## STATEMENT OF THE CASE<sup>2</sup>

Appellants claim a digital imaging system and method that scans a person's internal anatomy at different body positions and generates multiple cross-sectional digital image groups associated with different respiratory states. These cross-sectional image groups are used to generate first and second three-dimensional (3-D) digital images from which a resultant 3-D image is generated.<sup>3</sup> Claim 1, with a disputed limitation emphasized, is illustrative:

1. A method for generating a digital image indicative of an internal anatomy of a person, comprising:

scanning the internal anatomy of the person at a plurality of positions along an axis to obtain scanning data, wherein the scanning at each position is performed over at least one respiratory cycle of the person;

generating a plurality of cross-sectional digital images based on the scanning data;

generating first and second cross-sectional digital image groups associated with first and second respiratory states, respectively, of the person, the first cross-sectional digital image group including first and second digital images of the plurality of cross-sectional digital images obtained at first and second positions, respectively, along the axis, when the person has the first respiratory state, the second cross-sectional digital image group including third and fourth digital images of the plurality of cross-sectional digital images obtained at third and fourth positions, respectively, along the axis, when the person has the second respiratory state;

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<sup>2</sup> Throughout this opinion we refer to the Substitute Specification filed Oct. 18, 2004, the Appeal Brief filed Nov. 9, 2007 and the Examiner's Answer mailed Feb. 4, 2008 for their respective details.

<sup>3</sup> See generally Spec. ¶¶ [0022], [0024], [0027]-[0031]; Figs. 3, 4.

generating first and second 3-D digital images utilizing the first and second cross-sectional digital image groups, respectively; and  
*generating a resultant 3-D digital image indicating at least a portion of the internal anatomy of the person utilizing the first and second 3-D digital images; and*  
storing the resultant 3-D digital image in a memory device.

The Examiner relies on the following prior art references to show unpatentability:<sup>4</sup>

Takagi	US 6,269,140 B1	July 31, 2001
Yanof	US 2003/0188757 A1	Oct. 9, 2003
Yao	US 2005/0078858 A1	Apr. 14, 2005
Claus	US 2005/0135558 A1	June 23, 2005

Caoili, *Urinary Tract Abnormalities: Initial Experience with Multi-Detector Row CT Urography*, Journal of the Radiological Society of North America, Vol. 222, Issue 2, pp. 353-360 (Feb. 2002).

The Examiner continues in the rejection under 35 U.S.C. § 103(a) (*see* fn.1) of:

1. Claims 1, 19, 21-26, 43, and 45-50 as unpatentable over Takagi and Claus (Ans. 4-13);
2. Claims 6 and 31 as unpatentable over Takagi, Claus, and Caoili (Ans. 13, 14);
3. Claim 17 as unpatentable over Takagi, Claus, and Yanof (Ans. 14); and

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<sup>4</sup> Effective filing dates for these documents precede Appellants' earliest effective filing date and are not at issue.

4. Claims 18, 20, 42, and 44 as unpatentable over Takagi, Claus, and Yao (Ans. 14, 15).

## ISSUE

The pivotal issue, based on Appellants' contentions (*see* Br. 15, 16), as well as the Examiner's findings and conclusions (*see* Ans. 18, 19), is whether the Examiner erred in determining that Takagi and Claus, alone or in combination, teach or suggest generating a resultant 3-D digital image using first and second 3-D digital images.

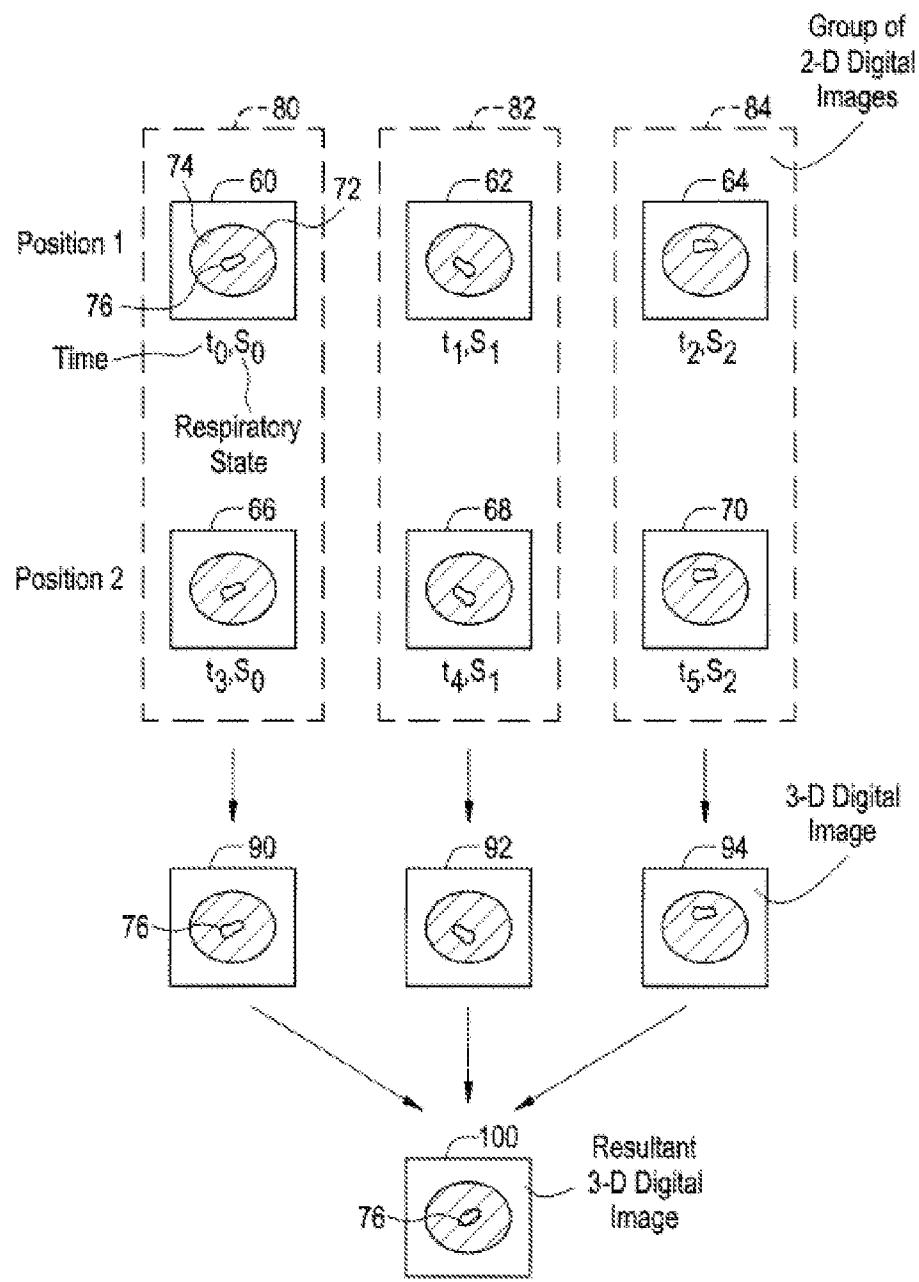
## FINDINGS OF FACT

The record supports the following Findings of Fact (FF) by a preponderance of the evidence:

### *Specification*

1. Appellants' Specification discloses using a group of different cross-sectional image groups to generate a plurality of 3-D images. Several of the plurality of 3-D images then are selected and used to generate a resultant 3-D image (¶¶ [0030], [0031]; Figs. 3, 4 (Fig. 3 reproduced below for reference)).

FIG. 3



Specification Figure 3 shows a schematic view for Generating a Resultant 3-D Digital Image

2. Appellants' Specification further discloses that the taught "invention can . . . be embodied in the form of computer program code . . . stored in a storage medium . . . , or transmitted over some transmission medium[] such as . . . electromagnetic radiation" (¶ [0060]).

*Claus*

3. Claus teaches an imaging system and method for generating one or more 3-D images constructed from fluoroscope projection images of the internal anatomy of a person (Abstract).
4. Claus discloses that more than one reconstruction of a data set or volume for "different 'states' of the imaged anatomy [e.g., phases of heart beats] may be concurrently maintained." (¶ [0051]).
5. Claus also discloses that "[s]ince the three-dimensional image may be viewed from any perspective, it may be useful to rotate the volume rendering to provide the best view . . ." (¶ [0054], [0056]).

#### PRINCIPLES OF LAW

Analysis of claim rejections begins with a determination of claim scope, which is the broadest reasonable construction consistent with the specification. *In re Prater*, 415 F.2d 1393, 1404-05 (CCPA 1969); *In re Am. Acad. of Sci. Tech Ctr.*, 367 F.3d 1359, 1364 (Fed. Cir. 2004).

When a rejection under 35 U.S.C. §103 is made, the Examiner is required to establish underlying factual determinations for deciding the legal

question of obviousness. *In re Fine*, 837 F.2d 1071, 1073 (Fed. Cir. 1988). The required factual determinations are set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 17 (1966) (stating that 35 U.S.C. § 103 leads to three basic factual inquiries: the scope and content of the prior art, the differences between the prior art and the claims at issue, and the level of skill in the art).

## ANALYSIS

### *Claims 1, 19, 21-26, 43, and 45-50*

Appellants group these claims and state that they “stand or fall together as a group” (Br. 14). Appellants then assert, *inter alia*, that Takagi and Claus fail to teach a limitation recited in all of the independent claims 1, 26, and 50; namely “generat[ing] a resultant 3-D digital image indicating at least a portion of the internal anatomy of the person utilizing the first and second 3-D digital images” (Br. 15, 16; *see* FF 1).

The Examiner, with respect to Takagi, acknowledges that the reference “fails to teach processing the 3-D digital images to obtain a resultant 3-D digital image indicating at least a portion of the internal anatomy of the person” (Ans. 6), but finds the recited limitation reads on Claus (*id.*). Appellants assert a distinction from Claus by arguing that the reference “is directed to a system that generates a plurality of 2-D fluoroscopy images then generates a 3-D image based on the plurality of 2-D fluoroscopy images” (Br. 15) (emphasis deleted). Appellants more particularly argue that Claus “does not provide any teaching of[] ‘generating a resultant 3-D digital image . . . utilizing . . . first and second 3-D digital

images”’ (Br. 15, 16) (emphasis deleted), which is the disputed limitation recited in each of independent claims 1, 26, and 50. We agree with Appellants.

In support of the position that Claus reads on the disputed limitation, the Examiner directs attention to paragraphs [0051], [0054], and [0056] of Claus (Ans. 6, 10, 12, 18, and 19). We find, however, as argued by Appellants, no disclosure in these cited paragraphs, or elsewhere within Claus, of utilizing multiple, e.g., two, 3-D images to generate another, i.e., a resultant, 3-D image. To the contrary, we find Claus teaches generating 3-D images from projection images (FF 3), maintaining the generated 3-D images (FF 4), and rotating the generated 3-D images to provide different perspectives (FF 5). We do not find that Takagi and Claus, alone or in combination, teach or suggest generating a resultant 3-D image using previously generated first and second 3-D images.

We, therefore, will not sustain the Examiner’s 35 U.S.C. § 103(a) rejection of independent claims 1, 26, and 50. We also will not sustain the rejection of claims 19, 21-25, 43, and 45-49 respectively dependent from claims 1, 26, and 50.

#### *Claims 6 and 31*

Claims 6 and 31 are rejected under § 103(a) as being unpatentable over Takagi, Claus, and Caoili (Ans. 13, 14).

Appellants reiterate the argument made for the base independent claims 1 and 26 that is directed to Takagi and Claus and addressed *supra* (Br. 18, 19). Further, Appellants argue that Caoili does not cure the

deficiencies of Takagi and Claus (Br. 19). The Examiner continues in relying on Claus for the disputed limitation (Ans. 13) and does not indicate that Caoili teaches or suggests the disputed limitation. We also do not find Caoili teaches or suggests the disputed limitation. Accordingly, for the reasons indicated previously, we will not sustain the rejection of claims 6 and 31 that incorporate the disputed limitation.

*Claim 17*

Claim 17 is rejected under § 103(a) as being unpatentable over Takagi, Claus, and Yanof (Ans. 14).

Appellants reiterate the argument made for the base independent claim 1 that is directed to Takagi and Claus and addressed *supra* (Br. 19, 20). Further, Appellants argue that Yanof does not cure the deficiencies of Takagi and Claus (*id.*). The Examiner continues in relying on Claus for the disputed limitation (Ans. 14) and does not indicate that Yanof teaches or suggests the disputed limitation. We also do not find Yanof teaches or suggests the disputed limitation. Accordingly, for the reasons indicated previously, we will not sustain the rejection of claim 17 that incorporates the disputed limitation.

*Claims 18, 20, 42, and 44*

Claims 18, 20, 42, and 44 are rejected under § 103(a) as being unpatentable over Takagi, Claus, and Yao (Ans. 14, 15).

Appellants reiterate the argument made for the base independent claims 1 and 26 that is directed to Takagi and Claus and addressed *supra* (Br. 20). Further, Appellants argue that Yao does not cure the asserted

deficiencies of Takagi and Claus (Br. 20). The Examiner continues in relying on Claus for the disputed limitation (Ans. 15) and does not indicate that Yao teaches or suggests the disputed limitation. We also do not find Yao teaches or suggests the disputed limitation. Accordingly, for the reasons indicated previously, we will not sustain the rejection of claims 18, 20, 42, and 44 that incorporate the disputed limitation.

#### CONCLUSION OF LAW

Appellants have shown that the Examiner erred in rejecting claims 1, 6, 17-26, 31, and 42-50 under § 103(a), because Takagi and Claus, alone or in combination with other applied references, fail to teach or suggest generating a resultant 3-D digital image using first and second 3-D images.

#### ORDER

The Examiner's decision rejecting claims 1, 6, 17-26, 31, and 42-50 is reversed.

REVERSED

KIS

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